



The European Organisation for Civil Aviation Equipment
L'Organisation Européenne pour l'Équipement de l'Aviation Civile



EUROCAE WORKING GROUP 51 (ADS-B)
Minutes of the 9th meeting of Sub Group 3 (ASA MASPS)
held jointly with RTCA SC-186 WG4 and WG1
at EUROCONTROL HQ, Haren, Brussels
11th-13th February 2002

Attendance

NAME

EUROCAE

Jean-Claude Richard
Bob Darby
Philippe Caisso
Gilles Caligaris
Ken Carpenter
Francis Casaux
Jean-Etienne Deraet
Soren Dissing-Andersen
Daniel Ferro
Bernard Gayraud
Goran Hasslar
Eric Hoffman
Larry Johnsson
Chris Machin
Damian Mills
Johnny Nilsson
Pascal Ponsot
Marco Porzi
Mike Shorthose
Eric Vallauri

RTCA

Jonathan Hammer
Steve Koczo
Rose Ashford
Randy Bone
Bob Hilb
Frank Mackowick
Michael Petri
Ken Staub
Gene Wong
Andrew Zeitlin

ORGANISATION

JCR Chairman, WG51, Thales Avionics, France
RD Secretary WG51, EUROCONTROL HQ
PC STNA, France
GC EUROCONTROL HQ
KC Qinetiq, UK
FC CENA / CARE-ASAS
JED Thales ATM, France
SDA EUROCONTROL HQ
DF EADS, France
BG CENA, France
GH Luftfartsverket, Sweden
EH EUROCONTROL EEC
LJ Luftfartsverket, Sweden
CM EUROCONTROL HQ
DM NATS, UK
JN Swedish CAA
PP Airbus, France
MP Marconi Mobile
MS Helios Technology, UK
EV CENA/Sofréavia, France

JH Co-Chair SC-186 WG4, Mitre/CAASD
SK Co-Chair SC-186 WG4, Rockwell Collins
RA NASA AMES
RB Mitre/CAASD
BH UPS
FM JHU/APL
MP FAA Technical Centre
KS Trios Associates
GW FAA AND-510
AZ Mitre/CAASD

AGENDA

Monday 11th February - EUROCAE WG51 SG3, RTCA SC-186 WG4 plus WG1

- 1 Introduction
- 2 Action items
- 3 EUROCAE application packaging discussion.
ASA MASPS Chapter 1 comments from EUROCAE
- 4 Phase diagrams (as part of application description for ED78a/DO-264 analysis)
- 5 Subgroup formation / organisation, planning

Tuesday 12th February - Breakout Groups

- 5A OSED - content
- 5B Methodology / Safety analysis / Fault trees
- 5C Terminology / Glossary / Editorial

Wednesday 13th February (a.m.) - Reconvene joint meeting EUROCAE WG51 SG3, RTCA SC-186 WG4 plus WG1 and WG2

- 6 Report of breakout groups
- 7 Input to SC186 WG6, revising ADS-B MASPS.
- 8 Required Surveillance Performance (RSP)
- 9 Any other items
Further discussion of EUROCAE packaging proposal
- 10 Future activities, joint meetings and actions summary.

Documents

Note: EUROCAE documents identified as Exx, RTCA documents as Rxx

File Name	Document Name	Agenda Item
E01-WG51 SG3-9 agenda1.doc	Agenda	1
E02-MASPS Development v3.doc	WG51 MASPS Development	3
E03-CA-02-037_1.0.PDF	CARE ASAS Activity 4. Review of ASAS applications studied in Europe	3
E04-review-ASAS-applications.ppt	CARE ASAS Activity 4. Review of ASAS applications studied in Europe - presentation	3
E05-WG51_11feb02_FCV1.ppt	EUROCAE WG51 ADS-B Application Package 1	3
E06-ASA MASPS Chapter 1 Airbus comments.doc	Airbus Comments on Draft RTCA SC-186 WG4 ASA MASPS Ch 1	3
E07-ASA MASPS Ch1 collected comments.doc	Collected e-mails commenting on Draft ASA MASPS	3
E08	Unused	
E09-Extract from POHA.doc	Ch2 of EUROCONTROL Preliminary OHA	5C
E10-CA-02-039(1.2).doc	Activity 4 Applications and Services	5C
E11-ICAO SCRSP template.doc	SICASP 7. Appendix A to the Report on Agenda Item 5 Attachment B. "Template for assessing of ASAS applications"	5A
E12-STNA_NUP_WP21_OSED_0.2.doc	NUP2 OSED template	5A
R01-IMC approach spacing safety table 0.4.xls	IMC approach spacing safety table	5B
R02-ASA MASPS 0.2.6.doc	ASA MASPS 0.2.6	3
R03-Approach spacing phase & process figures 0.2.ppt	Approach spacing phase & process diagrams	4, 5B
R04-approach spacing fault-event tree example.doc	Approach spacing fault-event tree example	5B
R05-ACM App V2.1.doc	Airborne Conflict Management v2.1	
R06-CSPA Ops v3.doc	Ops Concept for CSPA v3.0	
R07-Working Group 4 Action Items.doc	WG4/WG51-SG3 Action Items	2
R08-WG4 application Task matrix v2.doc	WG4 application Task matrix v2	
R09-USELT Application.doc	Proposal for Uninterruptible Surveillance /ELT Application	
R10-Apps outline v6-2.doc	Outline for: Application Descriptions Safe Flight 21 RTCA SC-186 May 8, 2001	5A
R11-Terminology e-mails.doc	Terminology e-mails	5C

1.0 Introduction

The meeting was called into session at 10:00 am on Monday February 11, 2002.

2.0 Action Item Summary

Most actions were dealt with by putting them into further specific agenda items in the meeting. The action item list has been updated to reflect the current, post-meeting, status.

RTCA had circulated a draft Chapter 1 for their ASA MASPS and solicited comments. Ken and Daniel Ferro (Airbus) had made comments, and these were discussed later in the meeting. Ken (paper E7) had several detailed comments, which would be dealt with bilaterally. His request for clarity concerning Enhanced Visual Acquisition (Does the application discussed in the MASPS concern the process of visual acquisition in many applications, or is it Enhanced See and Avoid?) produced more discussion. Francis said that the key issue was whether there was a change in rules or procedures. The issue was referred to WG1. Daniel (paper E6) was interpreted as expressing a desire that the architecture is not defined or specified.

Previous WG4 / WG51-SG3 Action Items

RTCA Id	Action on	Action	Status / Discussion
12-01-01	SK, JH	Ask WG51 to review chapter 1	Closed See Agenda item 3
10-01-06	RD	Forward NUP SEVA document to RTCA	Closed
11-13-02	WG51	WG51 to consider consequence list provided by WG4	Closed See Breakout Group 5b
11-13-03	WG51	WG51 to provide feedback on WG4 comments 6-10 on OHA	Closed See Breakout Group 5b
AIP10-01-02	Terminology SG: AZ, EH, RD, FC, Dave Spencer	Create glossary subgroup and define the following terms: <ul style="list-style-type: none">• Probe• Runway incursion• Service level• Application• Operational Hazard• Operational Consequence• Mitigation• Avoidance• Environmental Factor• Application Phases	Closed See Breakout Group 5c
AIP10-01-04	JH, SK, JN	Review ASA MASPS text to make sure that system objectives are articulated	Closed See Agenda item 3
AIP10-01-05	DF, EV, JN, EH	Find appropriate representative to coordinate operational application with RTCA (see 10/01 joint meeting minutes)	Closed See Agenda item 3
	<u>Application</u> NUP11 In Trail Procedures NUP11 Arlanda Station Keeping NUP11 Frankfurt Station Keeping NUP11 EVA NUII SEVA (Stockholm, Brussels, Helsinki, Toulouse, Copenhagen)		<u>Point of Contact</u> Brynjar Arnarson (Brynjar.Arnarson@tern.is) Per Ahl (per.ahl@avtech.nu) Rainer Kaufhold (Rainer.Kaufhold@dfs.de) Matthias Groth (matthias.groth@dlh.de) Lars-Goran Stridsman (lars-goran.stridsman@lfv.se)

New Actions

WG51 SG3 Action #	SC-186 WG4 Action #	Action on	Action (brief summary)
9/1	2-02-01	SC-186 RB	(From Agenda 3) RB to be point of contact for preparing 2 page RTCA application summaries using the format proposed in Eric Vallauri's paper (E04)
	2-02-02	JH, RA, BH, KC, DF	Address Ken's comment on ASA MASPS draft Section 1.6.2 regarding not maneuvering on the basis of TCAS targets alone
	2-02-03	MP, SC186 editorial	1. Review ASA MASPS for use of the word "system." Check whether "function" is more appropriate. 2. Add references as appropriate to PO-ASAS e.g. section 1.2.1 3. add words such as "is intended to" where appropriate, e.g., section 1.2.1
9/2	2-02-04	All	(From Agenda 3) Comments on Eric Vallauri's paper to be e-mailed to the author, copy to be posted on the EUROCAE web-site, WG51 workspace.
9/3	2-02-05	All	(From Agenda 3) Any further comments on ASA MASPS Ch 1 to be e-mailed to the WG4 list.
9/4	2-02-06	SC-186 RB WG51 DF	(From Group 5A) RB to update SC-186 template; start work on joint OSED
9/5	2-02-07	WG51 DF	(From Group 5A) DF to note differences with respect to OSED NUP
	2-02-08	SC186 RB	(From Group 5A) Provide feedback to ICAO SCRSP ASAS SG on template differences between RTCA and ASAS SG.
9/6	2-02-09	WG51 KC	(From Group 5A) KC take RB template comments to ICAO (SCRSP)
	2-02-10	SC186 RB	(From Group 5A) Coordinate with WG4 on NUP and ICAO template items not in RTCA template
	2-02-11	SC186 JH	Provide loss of separation criteria explanation in consequence list
9/7	2-02-12	SC-186 JH	(From Agenda 4 and 5B) JH to provide symbology guide for RTCA phase diagrams
9/8	2-02-13	WG51 FC & SC-186 JH	(From Agenda 9) FC and JH to be points of contact for preparing detailed proposal for joint EUROCAE/RTCA ASA development, derived from applications packaging discussion, to be presented initially at the June 2002 Plenary of SC-186 and discussed fully at September Joint EUROCAE / RTCA Plenary.
9/9	2-02-14	SC-186 GW & FM	(From Agenda 3) to consider how to handle an equivalent of the EUROCAE proposed GSA MASPS within the FAA / RTCA structure

3 Application packaging discussion

3.1 Initial package of applications – Francis Casaux presented paper E05, outlining a proposed “packaging” scheme for applications and proposing a preliminary list of applications to be included in “package 1.” Packages will comprise as set of applications for which the ASA MASPS would be developed, followed step-by-step with the other required MASPS and MOPS.

Package 1 must stand on its own and be of sufficient utility and desirability to the system users that they will equip. Francis stated the point of view that we can't expect the users to be able to justify the equipment purchases on the promise of a potential future economic payback.

GSA MASPS: Francis introduced the idea of a ‘Ground Surveillance Applications’ (GSA) MASPS, noting that much of the material for this already exists.

Schedule - the proposed completion time-scale was as follows:

- GSA and ASA MASPS: second half of 2003
- functional MASPS for ADS-B, TIS-B and point to point MASPS if required: first half of 2004
- MOPS for equipment: second half of 2004 (including 1090 and VDL M4)

Discussion:

- ASSAP/CDTI: Jonathan pointed to absence of ASSAP and CDTI MOPS in Francis' presentation; Francis agreed that these should be included.
- ASA MASP Schedule: The group understood that the ASA MASPS would be produced by RTCA alone for summer of 2002. This will be an initial document and will be treated by EUROCAE as interim. The latter half of 2003 should be revision A of ASA for RTCA, and the first ASA MASPS for EUROCAE. There was agreement that the latter half of 2003 would be an appropriate schedule for a joint ASA MASPS.

With respect to the other documents in the sequence Jonathan felt that the proposed EUROCAE schedule is consistent with tentative RTCA plans; the opportunity therefore presents itself to have further MASPS and MOPS (ADS-B, TIS-B, ASSAP, link MOPS) developed as joint documents in the future.

- GSA: Concerns were raised by Gene Wong regarding the RTCA role in producing a GSA MASPS. A GSA MASPS would be highly desirable but the proper level of the document needs to be worked out vis-à-vis FAA responsibilities for ground systems. In addition the idea needs to be brought forward to the RTCA program management committee (PMC). EUROCAE representatives pointed out that the GSA MASPS also requires a change to terms of reference for WG51; GSA is also still notional for WG51.

Francis pointed out that GSA for package 1 is an opportunity for ATS providers to get their foot in the door for the future.

- Jonathan pointed out that there may not be a 1 to 1 mapping between service levels and packages; Francis appeared to agree with this view.

Eric Vallauri presented paper E04: “Review of ASAS Applications studied in Europe.” This paper summarised, in a compact fashion, the major applications that are being developed in Europe. The paper examined 34 applications; these were observed to fit within 6 types of operational procedures; when further examined the result was approximately 14 separate applications. Many of the applications look the same; it takes a closer examination to see if this is actually true.

Paper E05 was agreed to be a very useful document, which should be kept up to date. Also, from the EUROCONTROL point of view, a link from the emerging "Operational Improvements" to the applications would help the wider use of the paper, and would go towards identifying associated benefits. An *Action* was placed for all to comment on paper E05, directly to Eric Vallauri.

It was agreed that a similar condensed version of US applications should be put together. Randy Bone took *action* to co-ordinate the development of short (e.g., 2 page) write-ups of the US applications.

Back to paper E05, application packaging

Francis' presentation attempted a complete statement of all areas that need to be coordinated.

WG51 would like to include approach spacing as a part of package 1. The other RTCA probe applications would not fit into package 1.

Gene Wong wanted specific agreement and plans to work on documents rather than general agreement to cooperate. Jonathan again suggested that a realistic aim is for EUROCAE MASPS to coincide with rev A of RTCA MASPS. This does, however, depend on a precise convergence on the applications included and their detailed description.

Francis and others agreed that additional work is required for Europe to harmonize their applications.

There was general agreement that a common, step by step approach to the ASA MASPS was possible between RTCA and EUROCAE.

3.2 Comments on ASA MASPS Chapter 1

Paper E07 -- Ken Carpenter's comments

- 4.1.1 Section 1.2.3: The text implies that TCAS is intended to provide improved situational awareness and conflict detection. This is not true.

Proposal: "ASA systems also differ from TCAS in being intended to provide situational awareness and detection of all conflicts (potential losses of separation), while TCAS is designed purely for last minute collision avoidance. ASA implementations are potentially relatively compact and inexpensive, and could thus provide protection against collision for smaller aircraft, for which TCAS might be not economical or not suitable for any reason."

Ken's proposal was agreed to.

- Comment on Section 1.4: "I would prefer FAROA and ASSA to be separated."

Ken's proposal was agreed to.

- Comment on section 1.6.2: "TCAS should not be listed as an element of the surveillance system."

Ken's proposal was not agreed to. Ken agreed to drop the comment as the reference was to the preceding figure.

- Section 1.6.2 again. At the end of the last paragraph, please add 'It would also be necessary to provide the means to ensure that pilots do not manoeuvre on the basis of TCAS targets alone.'

It was agreed to address this in a subgroup of Ken, Jonathan, Bob Hilb, Rose Ashford, and Danielle. Unfortunately this was not accomplished during the course of the meeting so an *action* needs to be taken to address this comment.

- Section 1.4.1.1: Is it 'enhanced see and avoid', or enhanced visual acquisition? If the former, the benefit is reduced risk of collision and that is the end of the story (but not the analysis). If the latter, the situation becomes confused because this application becomes a component part of other applications. The pilot can have many reasons to seek visual acquisition other than see and avoid, e.g. for visual approaches and visual acquisition of other traffic in the VFR traffic pattern at

uncontrolled airports. As far as I can tell, WG4 is analysing enhanced see and avoid (good), but the text at 1.4.1.1 does not make clear that this is the application.

Proposal: Delete the first sentence. Delete the reference to application D.1.15. Insert the words 'but the pilot's ability to see and avoid will be enhanced' at the end of the sentence 'Current operations and responsibilities will not change under this procedure'.

It was noted that there was a lot of e-mail traffic related to this comment. It was unclear was the disposition of this comment was.

Airbus comments – Paper E06

- Daniel Ferro -- Many of the comments related to the question of system vs. function as used in the ASA MASPS draft. It was recognized by WG4 that these terms are used interchangeably in the document and that the document should be searched for the use of "system." What is intended most often is "function."

Action: WG4 editor (Mike Petri) to review document for use of the word "system."

- Section 1.2.1: Appropriate references to PO-ASAS need to be made.

Action: WG4 editor to add reference to PO-ASAS.

- Section 1.2.1: Last paragraph makes statements that are not supported.

Action: WG4 editor to add words such as "is intended to" where appropriate.

- Section 1.4.1.1, Section 1.4.1.3: questions on application vs. tool; which is the appropriate term? Question was deferred to subgroup to meet later in the week to address terminology.

4. Phase diagrams

Jonathan introduced paper R03. Each application will be broken down into phases. The phases are further analyzed as component processes. The transitions between processes are states. Each process should be atomic. He outlined the application of the method to IMC approach spacing.

Johnny raised the issue of reference to third parties. Francis reported that Capstone asked for an identification (ident) feature. The controller asks the pilot to press the ident button, and the aircraft comes up in bright lights on his display. He went on to say that call sign will not be acceptable. WG6 seem to be putting ident into MASPS. CPDLC invoked. Ken reported that the appropriate panel is the Ops Panel.

Ken observed that there should be a one to one relationship between process diagrams and applications, and if two parties fail to agree the process diagram they are probably talking about different applications.

Jonathan took an *action* to supply Eurocae with phase diagram symbology conventions.

5. Breakout sessions.

The group divided into three separate working sessions: (A) templates, (B) Methodology, and (C) terminology.

5.1 Breakout Session 5A: NUP2 OSED, ICAO, & RTCA ASAS Application Template Comparison

Participants:

Rose Ashford, Randy Bone (Lead), Jean-Etienne Deraet, Daniel Ferro, Bob Hilb, Frank Mackowick, Johnny Nilsson, Mike Shorthose, Gene Wong

Task:

Review NUP2, ICAO, and RTCA templates for commonalities and differences. Note differences, discuss, and incorporate as necessary.

Outcome.

The group started with a high level discussion of what the NUP2 OSED template, ICAO template, and the RTCA template contain. The initial comparison was the RTCA versus the NUP2 and ICAO template. It was determined that the RTCA template was very similar to like sections in the other two templates. The RTCA template is an application description; and therefore, does not, and was not intended to, cover all sections in NUP2 OSED and the ICAO template (see below).

NUP2 Template

1. Background
2. Scope of Document
3. Airspace Characteristics- *Covered by RTCA template*
4. Service Description- *Covered by RTCA template*
5. Functional Characteristics- **RTCA SC-186 WG4 coordination necessary**

ICAO template

1. Definition of the ASAS application- *Covered by RTCA template*
2. Benefits and constraint- *Covered by RTCA template*
3. Operational procedures- *Covered by RTCA template*
4. Safety rational- **RTCA SC-186 WG4 coordination necessary**
5. Requirements for surveillance and aircraft state, or any other, data- **RTCA SC-186 WG4 coordination necessary**
6. Requirements for data-link- *Covered by RTCA template*
7. Pilot interface requirements- *Covered by RTCA template*
8. ASAS algorithm requirements- *Covered by RTCA template*

The sections that are not covered by the RTCA template but would be covered in the ASA MASPS appendices and were not discussed since WG4 did not have representation at the breakout session. These sections need further coordination with WG4. The minor differences between the relevant sections in the NUP2 template and the RTCA template were noted and will be incorporated in the next version of the RTCA template.

Although the RTCA template included the relevant sections in the ICAO template, it was not clear that the ICAO template contained all the information in the RTCA template. It was also unclear if ICAO desired from input from the group as to those differences.

When attempting to determine if the NUP2 template contained all the information contained in the RTCA template, it was found that the NUP2 template did not contain some of the areas covered in the RTCA template. These areas were noted and require further NUP2 discussion prior to adding to the NUP2 template.

The group determined that the NUP2 and RTCA templates are common enough to move forward with separate templates until deciding on a joint template for the joint MASPS.

The group also determined that it needs to be clear that the information contained in the application descriptions is not requirements but recommendations.

Actions.

- Update templates as necessary (Daniel Ferro and Randy Bone)
- Start work on joint OSED that will be used for the appendix for the joint MASPS

- Provide input to ICAO on material in RTCA application template but not in the ICAO template (Randy Bone / WG1 will provide input to Ken Carpenter)
- Coordinate with WG4 on the information not contained in the RTCA template but in the NUP2 and ICAO templates

5.2 BREAKOUT GROUP 5B: Methodology / Safety analysis / Fault trees

Participants:

Steve Kocz, Damian Mills, Chris Machin, Goran Hasslar, Philippe Caisso, Jonathan Hammer, Ken Carpenter

Task:

Review and coordinate methodology for safety analysis and fault trees. Review RTCA consequence list.

Outcome:

Methodology: Jonathan reviewed papers R01, R03, and R04 on approach spacing. Philippe Caisso agreed to try to apply this methodology to the EUROCAE applications.

Consequence list: Got into conversation about rates for catastrophic, etc. Difficult to pick a number to use. Several points of view were expressed on this subject. Nevertheless, a preliminary consequence list was tentatively agreed to.

5.2.1 Jonathan reviewed papers on approach spacing. Philippe gave a presentation on method (paper E08). ASOR is budget for air-side and ground-side, and is difficult.

Steve said that this sort of material from EUROCAE had already helped to lead WG4 to adopt their present method. The problem was that they needed to drill down a bit deeper.

Jonathan said that WG4 are concentrating on the consequences rather than the hazards, which occupy a middle position.

Chris went to the EUROCONTROL web site. EUROCONTROL had looked at 10 applications last year. There is a safety regulation group. The consensus from EUROCONTROL is that an acceptable accident rate is 1.55×10^{-8} per flight hour; this includes a total of all accidents combined.

Jonathan tried to identify what names are being used for the system safety budget allocation. Philippe said ASOR does budgeting at a gross level – so much for ground and so much for air. ASOR is objectives, targets, etc. FHA is proof that they are achieved.

Where ground is concerned, we need to document the assumptions; WG4 will not be diving into the details for the initial MASPS of the ground side. Instead, assumptions will be made on the ground side capabilities and level of criticality.

5.2.2 Back to consequences. Severity of loss of separation can be viewed from two radically different perspectives.

Finished up deciding (not agreeing) to put loss of separation into each category, with an associated probability of collision. Action to write an explanation for doing it this way. Chris, and others, were not completely happy.

Ken commented that situational awareness and airborne spacing applications can be analyzed for loss of separation as well as for collision. Not all were happy with this suggestion either.

5.2.3 Bottom line 1: There was agreement that WG4 and WG51 have considerable commonality of method.

5.2.4 Bottom line 2: The following consequence list was agreed to tentatively; as noted above there were still some who were not totally comfortable with it:

- 1) Catastrophic 10^{-9} e.g.,
 - a) mid-air collision
 - b) controlled flight into obstruction or terrain
 - c) high speed collision with a surface obstacle, aircraft, or vehicle resulting in loss of many lives
- 2) Hazardous (large reduction in safety margins) 10^{-7} e.g.,
 - a) Severe evasive maneuver
 - b) Wake vortex encounter in IMC or for small aircraft
 - c) Low speed collision with a surface obstacle, aircraft, or vehicle (with possible small loss of life)
 - d) Flight into severe weather (not applicable to present applications)
 - e) A loss of separation that results in the probability of collision of greater than 10^{-2} .
- 3) Major (significant reduction in safety margins) 10^{-5} e.g.,
 - a) leaving a prepared surface
 - b) A loss of separation that results in the probability of collision of greater than 10^{-4} .
 - c) increased workload in the context of the procedure resulting in a significantly reduced margin of safety e.g.,
 - Inadequate out-the-window search
 - Distraction or confusion
 - Inadequate attention to primary flight instruments
- 4) Minor
 - a) Slightly increased workload
 - b) Minor separation violation
- 5) No effect
 - a) Unnecessary maneuver (that doesn't result in any greater hazard)
 - b) Abort application (e.g., missed approach)

5.3 BREAKOUT GROUP 5C: Terminology / Glossary / Editorial

Participants: Francis Casaux, Bob Darby, Eric Hoffman, Larry Johnsson, Ken Staub, Mike Petri, Andy Zeitlin.

Principle: As agreed in the telecon with SC-186 WG4 held during the WG51 SG3-7 meeting at Toulouse (November 2001), the Group would not invent new definitions, but would adopt and/or amend existing definitions to the greatest extent possible.

Terms for which definitions are requested.
(See paper R11.)

Probe
Runway incursion
Service level
Application
Operational hazard
Operational consequence
Mitigation
Avoidance
Environmental factor
Application phase.

Following the principle of minimum necessary change, Group 5C recommended that terms for which it proposes definitions for should be added to Appendix B of the ASA MASPS (Draft 0.2.6) "Definition of Terms".

5.3.1 PROBE

Discussion.

The original problem was believed to be possible confusion between "probe" used in the sense of "conflict probe" (a possible ASA application) and "probe analysis" used as an analysis method for development of the MASPS. "Probe analysis" is explained in ASA MASPS paragraph 1.5.7. An extract from this paragraph can provide a definition for "probe analysis", which should also refer to the explanatory paragraph.

Definition.

PROBE ANALYSIS. A top level assessment to derive key requirements of anticipated future applications. (See paragraph 1.5.7 for more explanation.) (Adapted from ASA MASPS 0.2.6)

5.3.2 SERVICE LEVEL.

Discussion.

This term occurs also in the ADS-B MASPS and the draft TIS-B MASPS and should be identical in meaning between these two documents and the ASA MASPS. The term also needs to be qualified, as "service level" by itself is too generic.

Definition.

ASA SERVICE LEVEL. A set of performance requirements comprising surveillance, hardware and software quality to support a group of ASA applications.

5.3.3 APPLICATION, SERVICE, FUNCTION.

Discussion. Paper E10 contains an extensive review of the use of the words "application" and "service" and reaches a number of conclusions and recommendations. An extract from the paper says 'The terms "function", "service" and "application" can be considered as equivalent. To avoid ambiguities as far as possible, these terms should always be qualified (e.g. as ASAS function, an ATN communication service, an ADS-B application) and never used as standalone terms. For example the following expressions are correct:

- airborne surveillance is an ASAS function;
- ADS-B is a data link application;
- Enhanced visual acquisition is as ASAS application or an ADS-B application.'

Recommendation 1:

The terms "function", "service" and "application" should always be qualified and never used as standalone terms.

Definition:

ASAS application. A set of operational procedures for controllers and flight crews that makes use of an Airborne Separation Assistance System to meet a defined operational goal. (Proposal from the SCRSP ASAS SG.)

Recommendation 2:

The OPLINKP refers to the "ADS-B application as a data link application". This has in the past been found confusing (and is tautologous in defining "application" as "application"). OPLINKP should be asked to delete the word "application" and to define "ADS-B as a data link application". (See paper E10 for more detailed explanation of this point.)

5.3.4 ASAS.

Discussion.

The SCRSP ASAS SG also noted that the definition of ASAS is now changed (by the SCRSP).

Definition.

ASAS. Airborne Separation Assistance System. (ICAO SCRSP)

Recommendation:

The ASA MASPS title should be changed to become "MASPS for Airborne Separation Assistance (ASA)" in order to be consistent with SCRSP.

5.3.5 OPERATIONAL HAZARD

Discussion.

The word "operational" was thought to be unnecessary. "Hazard" is defined in DO-264/ED78A. (This should be checked with Philippe Caisso.)

Definition:

Hazard. A situation which has the potential to lead to harm. (ED78A / DO-264)

5.3.6 OPERATIONAL CONSEQUENCE

Discussion.

The definition used in paper E09 "Overview of Preliminary Operational Hazard Assessment Methodology" was considered to be largely suitable.

Definition:

Operational Consequence. The worst case direct effect of a hazard on operations and on Air Traffic Services. (Adapted from "Overview of Preliminary Operational Hazard Assessment Methodology")

5.3.7 MITIGATION, AVOIDANCE, ENVIRONMENT, ENVIRONMENTAL MITIGATION, ENVIRONMENTAL FACTOR

Discussion.

DO-264/ED78A has a definition which combines two ideas. It was thought useful to separate the ideas of "mitigation" and "avoidance". The DO264/ED78A definition also uses "environmental", for which a separate DO264/ED78A definition seems acceptable. However, the DO264/ED78A definition of "environmental mitigation" is incomprehensible - and unnecessary, as it is implied in the definition of "mitigation". "Environmental factor" also seems unnecessary.

Definition.

Mitigation. The means by which risk can be lowered to an acceptable level by controlling the severity of the operational consequence. There are two kinds of mitigation:

- *those which are environmental, which are described in the OSED, and which must be accounted for, when relevant, in order to assign the severity level of a hazard.*
- *Those which are provided by the design of the system or the application.*

(Adapted from DO-264 / ED78A)

Environment. The conditions, circumstances and influences surrounding and affecting the air traffic services. The environment excludes the new air traffic services being implemented. (DO264/ED78A)

Avoidance. The means by which risk can be lowered to an acceptable level by reducing the probability of a hazard. (Adapted from DO264/ED78A.)

5.3.8 SYSTEM

Discussion. In the review of Chapter 1 of the ASA MASPS, concern was expressed that the MASPS were seeking to go too far, in implying or defining an architecture. To make it clear this is not so, a paragraph is proposed to be inserted at the end of the existing paragraph 1.1.

Final paragraph of ASA MASPS 1.1 currently reads:

The word "subsystem" as used in this document includes all components that make up a major independent, necessary and essential functional part of the system so that the system can properly perform its intended function(s). If the system, including any subsystem, includes computer software, the guidelines contained in RTCA/DO-178B should be considered even for non-airborne applications.

Insert:

Requirements of the system and its sub-systems do not restrict equipments to any particular architectural implementation.

5.3.9 APPLICATION PHASE

Discussion.

This was thought to be in the list because of the first encounter with the idea of "phase diagrams" in the WG51 OSED. Since then, thinking has matured (as demonstrated by paper R03 and the surrounding discussion) and it may not now be necessary to provide a definition. However, if needed, a possible definition is proposed.

Definition.

Application Phase. A sequential step within an ASA application that leads to a clearly identifiable interim or final state.

5.3.10 RUNWAY INCURSION

Discussion.

The group did not understand why it should develop a definition for this.

6. Report back of three break out groups

6.1 Group A

The RTCA template was checked to make sure it is consistent with the NUP and SCRSP template. There will be feed back to SCRSP on the comparison with the SCRSP template, and further discussion within WG4 and SG3 on the comparison with the NUP template.

A joint approach to the OSED will be developed so that the descriptions of the applications studied by the two groups looks alike in the Appendix to the MASPS.

6.2 Group B

There were presentations on methodology, and Jonathan Hammer described approach spacing as an example. The method provides complete coverage of the failure mechanisms. The Group looked at mitigations and consequences, but this is not mature. RTCA is using "FaultTree+", but not allowing it to dictate the method.

Misleading guidance was used to illustrate the use of the tool, including how to handle a fault that has been identified.

ED78A process was also described. Discussed classification of hazards, and there is no consistency in present practice. EUROCONTROL analyses for loss of half a separation, and there was a long discussion of how critical that would be. The break-out group had classified criticality according to the probability of collision. There seems to be no consensus as to criticality of loss of separation.

Bob Hilb asked about collision risk modeling. Chris had advised us not to go down that road. Bob said, in that case, how do we reduce separation standards? The issue was discussed. Francis commented that CARE-ASAS, in association with EUROCONTROL/FAA R&D Committee Action Plan 1, would be developing safety considerations at the level of the PO-ASAS categories and would look at this issue.

Bob Hilb asserted that a truck running into an aircraft is not all that serious. He referred to loss of life, which is what the group had done.

6.3 Group C

The Group looked at terminology and proposed some definitions for the terms that had earlier been identified as potential for confusion or misunderstanding. A record of the discussion was circulated.

7. Revision of ADS-B MASPS, and SC186 WG6 questions

7.1 WG6 questions arising from revision A

WG6 is considering a revision A to the ADS-B MASPS. WG4 had been asked to consider some proposed changes. Ref: R10 - 242A-WP-11-01A.

Table 3-4 (a) gives things like accuracy requirements as a function of range. A Note 13 makes the requirement dependent on encounter geometry. Jonathan observed that this [rather curious] note was there for the benefit of VDL4. Jonathan said the requirement was derived from a perceived need to support collision avoidance.

NIC categories 9, 10 and 11 are proposed, for which both pressure and geometric altitude will be broadcast and containment bounds are specified for geometric altitude.

They want to delete NAC_V value 4 (0.3m/s and 1.5 ft/sec). If the motive is to save a bit, the group preferred to achieve this by redefining all the categories.

Exercise was abandoned, due to lack of time for an adequate discussion.

7.2 Plans for revision B

Plans are already in hand to move on to revision B after revision A. Revision B is likely to cover consequences of the ASA MASPS, and consistency with the EUROCAE ADS-B MASPS.

8. Required Surveillance Performance

Steve Koczko went back to RSP work that was being done when WG4 was working on the ASSAP MOPS. Diagram in ASA MASPS (v0.2.6) with ASSAP at center. ASSAP creates surveillance picture, and supports the ASA applications (guidance information and cues, conflict management, tools). Moved to expansion of ASSAP (page 44) and reviewed its functions. The output of the surveillance bubble is governed by RSP.

There is RNP and RCP, summarizing required performance, so it is natural to look for RSP. It will be a statement of how good things should be when everything is working normally. The issue of things that can go wrong are covered by the safety analysis.

WG4 is hoping for small number of performance levels falling out of the analyses of applications, and this leads to service levels, which are related to RSP. Francis commented that he would then expect an ASA service level to have a few values, linked to the operational applications supported, and which might also be related to the PO-ASAS categories and to the EUROCAE application packages. Some characteristics are related to ability to perform the intended purpose of the applications, while others limit the hazards. Both contribute to service level.

There are references to RXX, which is a total system level requirement of undetermined nature (at present). RXX will cover ground, ADS-B, TIS-B as well as RSP.

Daniel asked whether service level is really one-dimensional. This is not yet known. Francis supported concept of service level, and went on to remark that it has to be known by the controller and other aircraft. So it has to be broadcast, and it must also be dynamic to respond to operational variations. Discussion of what can be covered by flight plans, and where flight crew capabilities fit in, but Jonathan reasserted the need for real-time information on the operation of ASSAP.

9. Planning joint approach and selection of applications for study

RTCA would like to have the first revision to the ASA MASPS become a joint RTCA / EUROCAE document. For Europe, there is a need to select applications in the first package. There is a need to identify which applications require harmonization, and which are unique to one side or the other.

(Francis was speaking, but SG3 had had this conversation in an earlier meeting.) Jonathan suggested September as correct time frame to look for this agreement.

The tentative plan of the EUROCAE representatives would be in the next few months to clarify the responsibilities for deciding on the European applications, within the combined expertise of the European Programmes, EUROCONTROL and EUROCAE, and to map out the detailed development process for the definition of Package 1. This plan, and an update on the work accomplished, would be put before the expected plenary SC-186 meeting in June, (which is currently the date for agreeing first RTCA ASA MASPS) as preparation for having a full and detailed discussion on the further developed details at a joint meeting between EUROCAE and RTCA in September, 2002, in Europe.

10. Future Meeting & Telecon Dates

Date	Activity	Attendance / Topics / Notes
27 th February	Sc-186 WG4 telecon (and every two weeks following)	WG4 mainly unless specific topics of mutual interest to WG51 are discussed.
<i>Note also 12th-14th March Rome</i>	<i>ADS-B Symposium "Towards joint implementation of Operational Improvements enabled by ADS-B in Europe"</i>	
NOTE CHANGE OF DATE 27 th March EUROCAE Paris	WG51 34 Plenary	<i>Discuss Package idea and method of proceeding with EUROCONTROL and with other European projects. (MA-AFAS, NUP II, MEDUP, MFF, SEAP, CARE-ASAS etc)</i>
Week of 8 th April	SC-186 WG4 & SC186 Plenary	RTCA ballot / approval of certain documents.
23 rd -24 th April Toulouse	WG51 SG3/10 (tbc)	
6 th -10 th May Cedar Rapids	SC-186 WG4	
29 th -30 th May Malmo, Sweden	WG51 SG3/11 (tbc)	Starting at 0900 on 29 th May. (Travel the previous day)
17 th -21 st June RTCA HQ Washington DC	SC-186 WG4 & SC-186 Plenary	RTCA ballot / approval of certain documents. First presentation of proposal for Joint EUROCAE / RTCA applications packages.
Week of 16 th September	23rd-24th September Joint EUROCAE WG51 and RTCA SC- 186 Plenary. 25th-26th September Joint EUROCAE WG51 and RTCA SC- 186 Working Groups	Full discussion of Joint EUROCAE / RTCA applications packages.

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